

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. - 71. (cancelled)

72. (original) A prosthesis fixing device comprising:

a tubular element intended to lie, when the prosthesis fixing device is in the fitted position, with the outside in contact with the peripheral wall part of the circulatory system and to accommodate a prosthesis, inside it, the tubular element having pins arranged distributed around the periphery, said pins having pointed ends for penetrating the peripheral wall when the prosthesis fixing device is in the fitted position,

wherein the pointed ends face in radially outward direction of the tubular element, and each pin is arranged on an arm which, via a fold line or bending line, is attached by one end to the tubular element in a manner which permits swinging around said fold line or bending line, and

wherein the arms and pins are movable, by swinging about the fold line respectively bending line, from an insertion position, in which they are essentially located inside the tubular element, into a fixing position in which at least the pins, viewed in the radial direction, project outside the tubular element.

73. (original) The prosthesis fixing device according to Claim 72, characterised in that the arms and pins are located within the longitudinal boundaries of the tubular element in the insertion position and in that the tubular element is provided with radial passages located alongside the pins in the radial direction, in particular slit-shaped passages extending in the longitudinal direction of the arms, such that the pins are able

to emerge through these passages on swinging from the insertion position into the fixing position.

74. (original) The prosthesis fixing device according to Claim 72, characterised in that the arms, viewed in the longitudinal direction of the tubular element, extend essentially in said longitudinal direction.

75. (original) The prosthesis fixing device according to claim 73, characterised in that the arms extend in tangential direction of the tubular element.

76. (original) The prosthesis fixing device according to Claim 72, characterised in that each arm has at least two pins.

77. (original) The prosthesis fixing device according to Claim 72, characterised in that the arms viewed from the fold line respectively bending line point away from the surrounding vascular tissue.

78. (original) The prosthesis fixing device according to Claim 72, characterised in that the tubular element has a bottom and/or top flange extending in the circumferential direction of the tubular element, which flange, at least in the fitted position, projects outwards with respect to the tubular element in order to come into contact with, or at least to overlap, the bottom or, respectively, the top of surrounding vascular wall tissue, such as the valve annulus.

79. (original) The prosthesis fixing device according to Claim 78, characterised in that the bottom or, respectively, top flange has a number of flange fingers separated from one another by incisions, cut-outs or folds and arranged distributed around the periphery of the tubular element.

80. (original) The prosthesis fixing device according to claim 79, characterised in that the ends of the flange fingers each carry a said pin, and in that said fingers form said arms.

81. (original) The prosthesis fixing device according to Claim 72, characterised in that the tubular element is provided with a lower limit in order to prevent a prosthesis, such as a

valve prosthesis, placed in the tubular element after implantation of the prosthesis fixing device from detaching from the tubular element in the downward direction and/or with a top closure in order to prevent a prosthesis, such as a valve prosthesis, placed in the tubular element after implantation of the prosthesis fixing device from detaching from the tubular element in the upward direction.

82. (original) The prosthesis fixing device according to Claim 81, characterised in that the lower limit comprises a stop arranged inside the tubular element at the bottom thereof, such as an inward-pointing rib extending in the circumferential direction.

83. (original) The prosthesis fixing device according to Claim 81, characterised in that the top closure comprises a screw ring or a snap-fit ring and/or resilient snap-fit lips.

84. (original) The prosthesis fixing device according to Claim 81, characterised in that the prosthesis can be accommodated in the tubular element such that it can be turned about its longitudinal axis, for example by means of a screw thread connection, a bayonet connection or a combination of peripheral recesses in the one part and one or more ribs on the other part interacting therewith, the prosthesis fixing device also being provided with a twist lock in order to be able to fix the tubular and the valve prosthesis in a desired position with respect to one another.

85. (original) The prosthesis fixing device according to Claim 72, characterised in that the arms and pins are arranged at least partially in accordance with a sine wave-like pattern in the peripheral direction of the tubular element.

86. (original) The prosthesis fixing device according to Claim 85, characterised in that the sine wave path has a length of three sine periods together spanning the periphery of the tubular element.

87. (original) The prosthesis fixing device according to Claim 72, characterised in that the tubular element is a sine-wave-shaped ring or sine-wave-shaped cylindrical element with three sine wave periods.

88. (original) The prosthesis fixing device according to Claim 72, characterised in that the arms provided with pins have been bent, or can be bent, against a resilient force from an initial position, corresponding to essentially the fitted position, into the insertion position and are fixed or can be fixed in said insertion position in such a way that the fixing can be released in order to cause the arms provided with pins to bend back to, or at least in the direction of, the fitted position under the influence of the resilient force.

89. (original) The prosthesis fixing device according to Claim 72, characterised in that at least part of the external surface of the tubular element is concave.

90. (original) The prosthesis fixing device according to Claim 72, characterised in that the tubular element is provided with two or more rows of arms, provided with pins, running in the peripheral direction.

91. (original) An assembly comprising a valve prosthesis and a prosthesis fixing device according to Claim 72, the valve prosthesis comprising a cylindrical outer body fitting in the tubular element.

92. (original) A fixing device for fixing in a passage surrounded by vascular wall tissue, comprising:

- a tubular element that delimits a passage;

- an outer flange on the tubular element to come into contact, at the access side of the passage, with the vascular wall tissue surrounding the passage; and

- an inner flange made up of inner flange segments;

wherein each inner flange segment is arranged on an arm, one end of which is, via a fold line or bending line, attached to the tubular element in a manner which allows swinging about said fold

line respectively bending line, the inner flange segments extending in a radially outward direction from said arms, and

wherein the arms and inner flange segments are movable, by swinging about the fold line respectively bending line, from an insertion position, located essentially within the outline of the passage, into a fixing position in which the inner flange segments, overlapping the outer flange, can come into contact, on that side of the passage which faces away from the access side, with the vascular wall tissue surrounding the passage.

93. (original) The fixing device according to Claim 92, characterised in that the inner flange segments and/or arms are located within the longitudinal boundaries of the tubular element in the insertion position and in that the tubular element and/or outer flange is provided with radial passages located alongside the inner flange segments and/or arms in the radial direction, in particular slit-shaped passages extending in the longitudinal direction of the arms, such that the inner flange segments and/or arms emerge through these passages on swinging from the insertion position into the fixing position.

94. (original) The fixing device according to Claim 92, characterised in that the inner flange segments and/or arms have been bent, or can be bent, against a resilient force from an initial position corresponding to essentially the fitted position into the insertion position and are fixed respectively can be fixed in said insertion position in such a way that the fixing can be released in order to cause the inner flange segments and/or arms to bend back to, or at least in the direction of, the fitted position under the influence of the resilient force.

95. (original) The fixing device according to Claim 92, characterised in that the inner flange segments and/or arms can be fixed in an insertion position by means of a sleeve and/or an assembly of securing pins, which can be located on the outside, in the wall or on the inside of the tubular element, optionally making use of one or more passages through the inner flange

segments and/or arms, such that by sliding the sleeve and/or securing pins in the longitudinal direction of the tubular element the inner flange segments and/or arms can be slid out of the sleeve and/or securing pins in order to allow the inner flange segments and/or arms to return to the initial position.

96. (original) The fixing device according to Claim 92, wherein the inner flange segments and/or arms are made from a superelastic metal alloy or an alloy with a shape memory which has been activated/can be activated by heat, such as a nickel-titanium alloy, for example nitinol.

97. (original) The fixing device according to Claim 92, characterised in that the tubular element is provided with a lower limit in order to prevent a prosthesis, such as an obturator cap or vascular prosthesis or cannula or working conduit, placed in the tubular element after implantation of the fixing device from detaching from the tubular element in the downward direction, and/or with a top closure in order to prevent a prosthesis, such as an obturator cap or vascular prosthesis or cannula or working conduit, placed in the tubular element after implantation of the fixing device from detaching from the tubular element in the upward direction.

98. (original) The fixing device according to Claim 97, characterised in that the lower limit comprise a stop arranged inside the tubular element at the bottom thereof.

99. (original) The fixing device according to Claim 97, characterised in that the top closure comprises a screw ring or snap-fit ring and/or resilient lips.

100. (original) The fixing device according to Claim 92, characterised in that the prosthesis can be accommodated in the tubular element such that it can be turned about its longitudinal axis, for example by means of a screw thread connection, a bayonet connection or a combination of a peripheral recess in the one part and one or more ribs on the other part interacting therewith, the fixing device also being provided with a twist

lock in order to be able to fix the tubular element and the prosthesis in a desired position.

101. (original) The fixing device according to Claim 92, characterised in that the outer surface of the tubular element is concave.

102. (original) The fixing device according to Claim 92, characterised in that the bottom and/or top flange or fingers of the bottom and/or top flanges is/are provided with anchoring means, such as barbs, points or roughenings, for anchoring in the valve annulus.

103. (original) The fixing device according to Claim 92, characterised in that said device further comprises fixing means for releasably fixing the bottom and/or top flange in the second position.

104. (original) The fixing device according to Claim 92, characterised in that the fixing means comprise at least one annular element, such as a sleeve, ring or suture, which, when in the second position, are placed or can be placed around the bottom and/or top flange.

105. (original) The fixing device according to Claim 92, characterised in that the fixing means comprise a sleeve in which the tubular element with the bottom flange in the second position and optionally the top flange in the second position can be accommodated or have been accommodated in such a way that the tubular element, the bottom flange and the optional top flange can be pushed out of the sleeve by retracting the sleeve from the tubular element in the longitudinal direction facing away from the bottom flange.

106. (original) The fixing device according to Claim 92, characterised in that the valve prosthesis is fitted in the tubular element and in that the fixing means comprise a suture which is stretched taut around the bottom flange in the second position and the two ends of the suture run over the outside of the tubular element or through the wall of the tubular element to

that side of the tubular element which faces away from the bottom flange in order to be fixed in place at that side or beyond that end, it being possible to remove the suture after detaching the one end of the suture by pulling on the other end of the suture and those parts of the suture running over the tubular element being guided in guide means, such as small tubes or conduits.

107. (original) An assembly of a fixing device according to Claim 92 and an obturator cap, which can be accommodated therein, for occluding the passage surrounded by the tubular or tube-like element, wherein the obturator cap is covered on at least one side with one of vascular wall tissue, pericardium, vascular prosthesis and anti-clotting material.

108. (original) An assembly comprising a prosthesis fixing device according to claim 72 and a surrounding sleeve, wherein the fixing device is compressible from the fitted state for contact with the peripheral wall part to a compressed state, wherein the fixing device is arranged, in its compressed state, in the surrounding sleeve which defines a circumference smaller than the circumference of the fixing device in its fitted state.

109. (original) The assembly according to claim 108, wherein the prosthesis fixing device has in the compressed state a spirally wound configuration.

110. (original) The assembly according to claim 108, wherein the prosthesis fixing device has in the compressed state a folded configuration.

111. (original) An assembly comprising a fixing device according to claim 92 and a surrounding sleeve, wherein the fixing device is compressible from the fitted state for contact with the vascular wall tissue surrounding the passage to a compressed state, wherein the fixing device is arranged, in its compressed state, in the surrounding sleeve which defines a circumference smaller than the circumference of the fixing device in its fitted state.



112. (original) The assembly according to claim 111, wherein the fixing device has in the compressed state a spirally wound configuration.

113. (original) The assembly according to claim 111, wherein the fixing device has in the compressed state a folded configuration.

114. (original) The prosthesis fixing device according to claim 72, wherein the tubular element is made up of segments held together by means of a flexible wire extending along all segments.

115. (original) The prosthesis fixing device according to claim 72, wherein the tubular element is made up of segments held together by means of connecting wires extending between each adjacent segment.

116. (original) The prosthesis fixing device according to claim 115, wherein the connecting wires are made of a superelastic metal alloy with shape memory.

117. (original) The fixing device according to claim 92, wherein the tubular element is made up of segments held together by means of a flexible wire extending along all segments.

118. (original) The fixing device according to claim 92, wherein the tubular element is made up of segments held together by means of connecting wires extending between each adjacent segment.

119. (original) The fixing device according to claim 118, wherein the connecting wires are made of a superelastic metal alloy with shape memory.